

WHAT IS CLAIMED IS:

1. A process for manufacturing hydrocarbonaceous products from a methane-containing feedstock in a GTL facility comprising at least one furnace generating reduced CO₂ emissions, the process comprising:
 - a) forming syngas from a methane-containing feedstock by means of a partial oxidation reaction using a gaseous oxidant comprising molecular oxygen;
 - b) converting the syngas into C₃₊ liquid products and recovering an unreacted gas;
 - c) separating the C₃₊ liquid products to obtain a naphtha;
 - d) reforming the naphtha to produce a by-product hydrogen-containing gas stream;
 - e) recovering a hydrogen rich gas stream from at least one of the syngas and the by-product hydrogen-containing gas stream or combinations thereof; and
 - f) using a hydrogen rich fuel comprising the hydrogen rich gas stream and the unreacted gas in at least one furnace in the GTL facility to reduce CO₂ emissions generated by the facility.
2. The process of claim 1, wherein the GTL facility is a Fischer-Tropsch facility.
3. The process of claim 1, wherein the syngas comprises about 5 mole percent or less nitrogen.
4. The process of claim 1, wherein the CO₂ emissions from the GTL facility are at least about 15% less than if recovered hydrogen were not used as a fuel in the GTL facility.
5. The process of claim 4, wherein the CO₂ emissions from the GTL facility are at least about 30% less than if recovered hydrogen were not used as a fuel in the GTL facility.

6. The process of claim 5, wherein the CO₂ emissions from the GTL facility are at least about 50% less than if recovered hydrogen were not used as a fuel in the GTL facility.
7. The process of claim 1, wherein a hydrocarbonaceous product having a hydrogen to carbon stoichiometric ratio below about 2.0 is isolated.
8. The process of claim 7, wherein the hydrogen to carbon stoichiometric ratio is below about 1.90.
9. The process of claim 1, wherein the at least one furnace using the hydrogen rich fuel is altered in a manner by providing the furnace with an enlarged gas supply line, providing the furnace with enlarged burner nozzles, increasing convection zone heating of the furnace or combinations thereof.
10. The process of claim 1, wherein the hydrogen rich fuel comprises at least about 40% hydrogen, on a molar basis.
11. The process of claim 10, wherein the hydrogen rich fuel comprises at least about 60% hydrogen, on a molar basis.
12. A process for manufacturing hydrocarbonaceous products from a methane-containing feedstock in a GTL facility comprising at least one furnace generating reduced CO₂ emissions, the process comprising:
 - a) forming syngas from a methane-containing feedstock by means of a partial oxidation reaction using a gaseous oxidant comprising molecular oxygen;
 - b) converting the syngas into C₃₊ liquid products and recovering an unreacted gas;
 - c) separating the C₃₊ liquid products to obtain a naphtha;

- d) reforming the naphtha to produce a by-product hydrogen-containing gas stream;
- e) recovering a hydrogen rich gas stream from at least one of the syngas and the by-product hydrogen-containing gas stream or combinations thereof; and
- f) using a hydrogen rich fuel comprising the hydrogen rich gas stream and the unreacted gas in at least one furnace in the GTL facility so that a mole percent of CO₂ in a flue gas generated from the furnace, on a water-free basis, is represented by the following formula:

$$P\text{-CO}_2 \leq 22/(1-4.76(E\text{-O}_2/100)),$$

wherein E-O₂ represents mole percent excess oxygen, on a water-free basis.

13. The process of claim 12, wherein the mole percent of CO₂ in the flue gas from the furnace, on a water-free basis, is represented by the following formula:

$$P\text{-CO}_2 \leq 16/(1-4.76(E\text{-O}_2/100)).$$

14. The process of claim 12, wherein the GTL facility is a Fischer-Tropsch facility.
15. The process of claim 12, wherein the syngas comprises about 5 mole percent or less nitrogen.
16. The process of claim 12, wherein a hydrocarbonaceous product having a hydrogen to carbon stoichiometric ratio below about 2.0 is isolated.
17. The process of claim 16, wherein the hydrogen to carbon stoichiometric ratio is below about 1.90.
18. The process of claim 12, wherein the at least one furnace using the hydrogen rich fuel is altered in a manner by providing the furnace with an enlarged gas supply line,

providing the furnace with enlarged burner nozzles, increasing convection zone heating of the furnace or combinations thereof.

19. The process of claim 12, wherein the hydrogen rich fuel comprises at least about 40% hydrogen, on a molar basis.
20. The process of claim 19, wherein the hydrogen rich fuel comprises at least about 60% hydrogen, on a molar basis.